On the nomenclature of domestic animals

Colin P. Groves
Department of Archaeology and Anthropology, Australian National University, Canberra, A.C.T. 0200, Australia

Introduction

The scientific naming of domestic animals is a problem. Attention was drawn to it by Bohlken (1958, 1961), and the matter was raised again by Dennler de La Tour (1968). Following on these leads, I (Groves, 1971; BZN **27**: 269–272) applied to the Commission to have names given to 'domesticates' excluded from the provisions of the Code. After a few less than supportive comments the proposal sank like a stone. Lost, but not forgotten: Corbet & Clutton-Brock (1984) returned to the question and made their own proposals.

In this short review, I will explain what the nature of the problem is, survey the four different solutions that have been proposed, and make some further remarks of my own.

What is domestication?

One of the founders of modern domestication studies is Charles Reed and it is he (1984) who provides the most authoritative recent discussion of what exactly we mean by 'domestic animals' — those whose breeding is, in theory or in practice, controlled by humans: i.e. not simply tamed, or kept in zoos or laboratories, but controlled such that what is allowed to breed, and what is mated with what, is the criterion. We require also that this process of human control will have been going on for generations, because recently zoos have begun to take the same attitude towards some of their charges, controlling their breeding to maximise diversity for conservation purposes. The corollary to Reed's definition is that the domestic animals will have been altered in some ways — morphologically, behaviourally — from their wild ancestors. In each case there may be alterations meeting several human objectives: horse breeds differentially specialised for riding, racing, or pulling; cattle breeds specialised for beef, milk, or draught; and so on.

The consequence of all this is that a domestic 'taxon' relative to its wild ancestral taxon (1) differs from it but (2) is readily interfertile with it even though (3) in part sympatric with it; moreover (4) it is heterogeneous with respect to it.

Is a domestic 'taxon' — let us call it a *parataxon* — to be regarded as a different species from its wild ancestor? No; though the two may be, often are, sympatric without interbreeding, it is human vigilance alone that prevents them from interbreeding, and when this vigilance is relaxed the two simply merge (see Groves, Ziccardi & Toschi (1966) on the ass and, for a very neatly analysed example, French, Corbett & Easterbee (1988) on the cat). In addition, some domesticates may be derived from different subspecies of the wild ancestral species, or possibly from different wild species, so that a domestic 'species' would in effect be paraphyletic. Yet, at base, the domestic parataxon is in some way conspecific with its wild ancestor.

Is a domestic parataxon to be regarded as conspecific with its wild ancestor, but a different subspecies? No; a subspecies is a geographically delimited, as well as

morphologically differentiated, segment of a species, but, as stressed above, domestic parataxa and their wild ancestral species are often sympatric.

Is a domestic parataxon to be regarded as conspecific with its wild ancestor of which it constitutes a *suite* of subspecies? No; breeds are commonly maintained in sympatry with each other, they are not geographic vicars like subspecies.

Are different domestic breeds to be regarded as different species? No; they are often rather marginally differentiated, and form a potential reproductive continuum.

That is the problem: the dometic animals fit into no taxonomic mould — not even approximately. The Linnaean system, product of the pre-Darwinian era, fares tolerably well when faced with the evolutionary reality; but no juggling of it really copes with the human-created world of domestication.

Names of domestic animals

Corbet & Clutton-Brock (1984) pointed out that in most cases the domestic form of a species was scientifically named earlier than any wild form, often by Linnaeus himself. In the following cases the domestic name antedates (or is contemporary with) the wild one:

Domestic	*Wild*
(1) *Linnaean domestic names*	
Bos taurus (Cattle)	*Bos primigenius* Bojanus, 1827
Bos indicus (Humped cattle)	(Not certain)
Bos grunniens (Yak)	*Bos mutus* Przewalski, 1883
Bubalus bubalis (Water Buffalo)	*Bubalus arnee* Kerr, 1792
Ovis aries (Sheep)	*Ovis orientalis* Gmelin, 1774
Capra hircus (Goat)	*Capra aegagrus* Erxleben, 1777
Camelus bactrianus (Bactrian camel)	*Camelus ferus* Przewalski, 1883
Camelus dromedarius (Arabian camel)	(Not certain)
Lama glama (Llama)	*Lama guanicoe* Müller, 1776
Lama pacos (Alpaca)	(?hybrid, Llama x *L. vicugna*)
Equus caballus (Horse)	*Equus ferus* Boddaert, 1785
Equus asinus (Donkey)	*Equus africanus* Heuglin & Fitzinger, 1866
Canis familiaris (Dog)	*Canis lupus* Linnaeus, 1758
Felis catus (Cat)	*Felis silvestris* Schreber, 1777
Mustela furo (Ferret)	*Mustela putorius* Linnaeus, 1758
Cavia porcellus (Guinea pig)	*Cavia aperea* Erxleben, 1777
Carassius auratus (Goldfish)	*Carassius gibelio* Bloch, 1783
Bombyx mori (Silkmoth)	*Bombyx mandarina* Moore, 1862
(2) *One non-Linnaean domestic name*	
Bos frontalis Lambert, 1804 (Mithan)	*Bos gaurus* H. Smith, 1827

There is just one case where the wild name precedes the domestic name: *Sus scrofa* Linnaeus, 1758 for the Wild Boar vs. *Sus domesticus* Erxleben, 1777 for the domestic Pig. Strictly speaking, Linnaeus's *Sus scrofa* referred to both wild and domestic pig, although from his cited sources the wild form could be construed to have prior claim.

In several other cases the name *domesticus* (or *-a*) has been appended, perhaps not entirely formally, to the name of a wild species (such as *Bos javanicus domesticus*, Bali Cattle); in yet other cases the domesticate does not differ sufficiently from the wild species for there to have been a real qustion of differentiating them quasi-taxonomically (such as *Gallus gallus*, the Domestic Fowl).

This listing demonstrates the problem: in nearly every case the name given to the domestic parataxon has priority. If the rules of nomenclature were strictly followed, the name *Bos taurus* would refer to the wild (extinct) Aurochs as well as domestic humpless cattle.

Solutions so far

The solution offered by Bohlken (1958, 1961) was that one should never use the domesticate's name for the entire species. Instead, when referring to the domestic parataxon one should use the wild ancestral species's name followed by the domesticate's name, with 'f.' (for '*forma*') in between. Thus: *Bos primigenius* f. *taurus* for domestic cattle. The advantage of such a system is that the name of the biological species is referred to, plus a convention to show that an artificial (= domestic) form of it, not a subspecies, is being indicated. The disadvantage is, simply, that it flouts the rules of nomenclature: the prior name is being made subordinate, and an insert, 'f.', is used for which there is no sanction in the present Code. The scheme has, nonetheless, achieved quite wide currency, e.g. it is used by Herre & Röhrs (1990) in their textbook.

Dennler de La Tour (1968) proposed a more complicated and detailed scheme, which depends on adding '*familiaris*' to the name of a wild taxon. He noted that on occasion it would be useful to refer not just to a domestic form as such, but to a particular breed or local form; indeed names were in the past quite commonly given to breeds as if they were species or subspecies, and such names could be added after the '*familiaris*', which in such a case would usually be put in parentheses and shortened to '*fam.*'. Equally, the actual subspecies that gave rise to a particular domesticate might, on occasion, be known; and this too could be represented in the scientific name. So the domestic dog as such would be *Canis lupus* '*familiaris*'; the Torfhund, from the Swiss Neolithic lake dwellings, would be *Canis lupus* (*fam.*) *palustris*; and a domestic dog which one could be certain was derived from the Indian wolf, *C. lupus pallipes*, would be *Canis lupus pallipes* '*familiaris*'. But this is not all: feral forms (domestic stock run wild, to form a wild population) are designated '*exfamiliaris*', and those on the way to becoming domestic (usually from an archaeological context) are '*praefamiliaris*'. Thus we have *Canis lupus* (*exfam.*) *dingo*, and *Canis lupus* (*praefam.*) *canaanensis*. In those cases where the origin of a domesticate is unknown, as with the Arabian Camel (dromedary), the domestic name is retained. The advantage of this system is its consistency. The disadvantages are that, like Bohlken's scheme, it is not in accord with current rules; it is extremely cumbersome; and by making the whole name apparently scientific (italics, lower case) it threatens to create endless synonyms by, for example, spelling a breed name in a latinised way. One envisages long debates about priority between *Canis lupus* (*fam.*) *pastorgermanicus* and *Canis lupus* (*fam.*) *alsatianus*.

Realising that nomenclatural systems were in danger of proliferating, and that the two proposed so far both departed from the rules, I (Groves, 1971) applied to the

Commission for something to be done. Domestic parataxa could, by implication, already be considered outside the sphere of interest of the Code under Article 1a ('Zoological nomenclature is the system of scientific names applied to ... animals known to occur in nature ...'), but preferably this should be made explicit in the Code. There would, under such circumstances, be no *Canis familiaris* or *Bos taurus*; references to domestic forms of a species would be vernacular only, in whatever form an author might choose. The advantage to this scheme is that it recognises that domestic forms are parataxa, not natural taxa such as the Code is designed to deal with, and proposes explicitly to expel them from the Code, which would be left to its proper field of concern. A disadvantage is that many domestic nominal 'species' bearing Linnaean names (see above) are the types of their genera, and elimination of their names would require a wholesale redesignation of type species. When all is said and done, the proposal only cuts the Gordian knot rather than attempting to untie it as Bohlken's and Dennler de La Tour's schemes had at least tried to do.

Corbet & Clutton-Brock (1984) noted that there are times when scientific names, of a sort, would be useful for domesticates, and the names are there and well understood. Yet domesticates are still not conventional taxa (in their words, they are 'derivatives of their wild ancestral species but not parts of them'), so they recommend using their names binominally, as if they were species separate from their wild ancestors, but in quotation marks: *Canis* '*familiaris*', *Bos* '*taurus*'. The advantage of this scheme is that it preserves the well-known names and allows the domesticates to continue to serve as types of genera where necessary, yet allows one to recognise that they do not designate conventional taxa. The disadvantage is that it is not in accord with the Code; indeed, the authors recognise this, and note that many will prefer to use the names without quotation marks in order to conform to the rules of nomenclature.

Solutions for the future?

I am really not sure where we go from here. All four of the solutions proposed so far would really require an alteration to the Code, except for Corbet & Clutton-Brock's second option, whose practitioners would have to accept that they are maintaining a fiction.

We have to remember that it is not just professional zoologists who are involved. Archaeologists and animal breeders, to name just two fields of concern, must use scientific names, and a system inadequate to the task will be counter-productive. Breeds, or breed-groups, of domestic animals are still being described as if they were subspecies (see, for example, Peary, 1990, who coined new trinomina for River and Swamp breed-groups of domestic buffalo). The general public, who tend to have difficulty understanding what species and subspecies are, get inextricably confused. 'Is the dingo a wolf or a dog?' they ask. When I try to explain that this is a non-question, there is an immediate retort: 'But the wolf and the dog are different species; the wolf is *Canis lupus* and the dog is *Canis familiaris*!'.

It is high time that the question be addressed, and that a 'stable and universal' solution be found. Whether this is within the framework of the International Code of Zoological Nomenclature or by *explicit* exclusion from the provisions of the Code must be decided.

References

Bohlken, H. 1958. Zur Nomenklature der Haustiere. *Zoologischer Anzeiger*, **160**: 167–168.

Bohlken, H. 1961. Haustiere und zoologische Systematik. *Zeitschrift für Tierzuchtung und Züchtungsbiologie*, **76**: 107–113.

Corbet, G.B. & Clutton-Brock, J. 1984. Appendix: taxonomy and nomenclature. Pp. 434–438 *in* Mason, I.L. (Ed.), *Evolution of Domesticated Animals*. Longman, London & New York.

Dennler de La Tour, G. 1968. Zur Frage der Haustier-Nomenklatur. *Säugetierkundliche Mitteilungen*, **16**: 1–20.

French, D.D., Corbett, L.K. & Easterbee, N. 1988. Morphological discriminants of Scottish wildcats (*Felis silvestris*), domestic cats (*Felis catus*) and their hybrids. *Journal of Zoology, London*, **24**: 235–259.

Groves, C.P. 1971. Request for a declaration modifying Article 1 so as to exclude names proposed for domestic animals from zoological nomenclature. *Bulletin of Zoological Nomenclature*, **27**: 269–272.

Groves, C.P., Ziccardi, F. & Toschi, A. 1966. Sull' asino selvatico africano. *Ricerche di Zoologia applicata alla Caccia*, Supplement, **5**(1): 1–11.

Herre, W. & Röhrs, M. 1990. *Haustiere — zoologisch gesehen*. Gustav Fischer, Stuttgart & New York.

Peary, J.Y. 1990. Revision of buffaloes' position on the zoological scale. *Buffalo Bulletin*, **9**: 9–17.

Reed, C.A. 1984. The beginnings of animal domestication. Pp. 1–6 *in* Mason, I.L. (Ed.), *Evolution of Domesticated Animals*. Longman, London & New York.